Remarks/Arguments:

This is a reply to the office action of January 16.

Claim 26 has been amended. Kindly reconsider this application in view of the following remarks.

The rejection of claim 17 is traversed for the following reasons:

In Chauville's engine, the intake valve (4) is placed – together with a gearbox therefor – in the internal rotor (see Fig. 1 in FR 2324870 Patent). Moreover the discharge valve (7) together with gearbox thereof is placed, instead, in the external rotor. In the engine of the present application, the intake valves, discharge valves, and the corresponding gearbox are all situated in the external rotor and the air inlet into the cavities is provided by spirally shaped conduits, thus obtaining a compression effect due to centrifugal force. The conduit is formed in a disk (centrifugal compressor), installed on the external rotor, and air is not drawn through the internal rotor axis, as in Chauville's engine. In the presently claimed engine, the external rotor serves as a rotating head.

With reference to US 3,311,094, Kehl's engine does not have any valves; rather, it uses intake and discharge ports (Column 6, lines 57-67) placed in the upper and lower portions of the external rotor. Since these intake and discharge ports are formed into the external rotor, they must rotate with the rotor and therefore they point up, down, left or right depending on the current stroke and are closed or opened by the body of the internal rotor depending on the current stroke.

The rejection of claim 18 is traversed for the following reasons:

In Chauville's engine there are conventional poppet valves, which at the exhaust gas passage do not generate any torque along the tangential direction because the gas exits from the combustion chamber along the radial direction through the valve 25 opening, thus generating great turbulence in the downstream chamber; this is common for conventional poppet valves. In the engine now claimed, the discharge valve, shaped as a truncated cone and a with parabolic cross-section, deflects gas from a radial direction to a tangential direction by passing a full port without turbulence thus generating a great second level torque. In other words, the discharge valve operates as a turbine blade, which is new for any internal combustion engine based on the Otto cycle.

Claim 19 is deemed patentable over Chauville because in Chauville's engine the exhaust gas entering the chamber placed downstream of the discharge valve has a turbulent flow along a radial direction and then it is piped into a conduit (element 8 in fig. 1 and 8) extending in a tangential direction, thus changing the exhaust gas direction. Therefore, in Chauville's engine the element (8) generates an exhaust gas deviation along the tangential direction and not the discharge valve as well as in the engine of the present invention.

Chauville in his disclosure at line 33 of page 1 talks about tangential ejection, thus meaning that the element (8) modifies only the direction of the exhausted gas. In particular he talks about an orifice through which the exhausted gas is ejected in a tangential direction.

In the presently claimed engine, instead, the gas is deviated along a tangential direction in the discharge valve, thus generating a second level torque; immediately downstream, it enters into a nozzle having parabolic walls in which the gas expands and is cooled, thus generating a third level torque.

The shape, position and operation of the intake valve of Patrono's engine is not randomly chosen. Besides being a rotary valve the movement which does not interfere with engine balance, it is a full passage valve (and not a poppet valve with its known turbulence) and it is placed at the periphery of the outer rotor because in such position it forces the combustion air entering the engine around the outer rotor axis to be compressed by centrifugal force in order to reach and pass through it, before entering the combustion chamber. The position of the valve makes Patrono's engine a supercharged engine, thus producing better performance than a normally aspirated engine. The valve position thus is important and not irrelevant as the examiner implies at first and second line of page 5.

The portion of the present application's disclosure which examiner refers to at page 5, lines 4 - 7, of the office action does not contains any functional wording by itself. It describes the operation of a nozzle of a rocket engine since at the discharge valve outlet there is a nozzle not found in any other internal combustion engine based on Otto cycle.

Significant differences are between the present invention and Chauville are identified in the table below.

INLET VALVE	**Patrono's Engine**	**Chauville's Engine**
Position	*Outer rotor periphery*	*On inner rotor*
Shape	*Truncated cone*	*Common poppet*
Movement	*Rotating valve*	*Reciprocating valve*
Port	*Rectangular (full flow)*	*Annular*
Negative effects on engine balance	*Absent or minimum (rotating masses)*	*High (reciprocating masses along radial direction)*
DISCHARGE VALVE		
Position	*Outer rotor periphery*	*Outer rotor periphery*
Shape	*Parabolic cross-section Cone truncated (like turbine blade)*	*None: valve set up in axial position does not generate supercharging effects*
Movement	*Rotating valve*	*Reciprocating valve*
Port	*Rectangular (full flow)*	*Annular*
Negative effects on engine balance	*Absent or missing (rotating masses)*	*High (reciprocating masses along radial direction)*
Consequences on engine performance	*Gases deviated tangentially. Parabolic section generates a deviation tangentially thus generating a second level torque*	*None: exhaust gas exit radially*
FURTHER ELEMENTS		
Chamber downstream of discharge valve	*Absent*	*Present*
Conduit or "outlet orifice"	*Absent*	*Present; conduit serving to deflect gas tangentially with a low second level torque generation*
Nozzle	*Present just downstream of discharge valve serving as fast gas expansion and cooling with high third level torque generation*	*Absent; third level torque not present*

The differences identified in the above table prevent Chauville's engine from performing the functions claimed in claims 17, 18 and 19. The statement in the office action at page 5 at lines 8 to 10 is respectfully traversed.

The rejection of claim 20 is traversed for the following reasons:

Chauville fails to disclose an injection pump in any rotor because in his engine lacks any injection pump or any injector. In fact, Chauville's engine is designed to operate only as a carbureted engine, as Chauville describes at page 3, lines 26 - 29.

Regarding Blanchard, the examiner maintains that Blanchard fails to describe where he puts the pump, but from Blanchard's engine drawings a person of ordinary skill would understand that his pump (49) is a conventional electric pump which maintains the fuel level into the carburetor (50) and both elements are outside the engine.

The presently claimed engine has the fuel pump on the inner rotor, where the injectors also are. Until now, no engine has adopted such solution.

The pump position is not random or a mere matter of design choice. It is a particularly advantageous position because the fuel is transferred to the pump along the hollow axis of the inner rotor at "low pressure" without any problems of sealing or leaking.

If a conventional external injection pump had been adopted, the fuel would have had to be transferred to the injectors through the rotor axis but at "high pressure" along with obvious leaking and sealing problems.

Moreover, mounting the injector on the inner rotor improves fuel nebulization since the pressure provided by the pump is augmented by pressure due to centrifugal force as the rotor rotates at high speed.

Claim 26 has been amended to recite "a planet member and a satellite member of a curved shape, fixed at the end of planet and oscillating around its axis, adapted to act as a compression ring continuously fitting to the inner surface of the external rotor".

Neither Chauville's engine nor Osigwe Godwin Okey's engine have a similar sealing system. In Chauville's engine, sealing is achieved by the element (3) in Fig. 8, which slides inside the element (5) which, in turn, slides inside the outer rotor (2), and therefore is completely different from the sealing system now recited in claim 26. In Osigwe Godwin Okey's engine, the sealing is done by conventional piston rings (8a), (8b) and (8c) inserted in grooves formed in blades (6) (see fig. 3) and therefore again completely different from claim 26's sealing system.

Regarding claim 27, with respect, the examiner's comments about claim 27 were not understood. The examiner's passages in Bocur "Figure 1B, column 1, lines 15 - 22, column 9, lines 57- 67, column 10, lines 1 - 2" do not describe a seal system.

We believe that the claims now presented distinguish the invention from the prior art, and that this application is in proper condition for allowance.

Respectfully submitted,

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